Bayesian Networks and Influence Diagrams

A Guide to Construction and Analysis

By Uffe B. Kjærulff and Anders L Madsen

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The book is available on Springer's website.

There is a discussion board at forum.hugin.dk dedicated to this book.

About this book

- Comprehensive introduction to probabilistic networks
- Written specifically for practitioners of applied artificial intelligence
- Complete guide to understand, construct, and analyze probabilistic networks

Probabilistic networks, also known as Bayesian networks and influence diagrams, have become one of the most promising technologies in the area of applied artificial intelligence, offering intuitive, efficient, and reliable methods for diagnosis, prediction, decision making, classification, troubleshootin data mining under uncertainty.

Bayesian Networks and Influence Diagrams: A Guide to Construction and Analysis provides a comprehensive guide for practitioners who wish to unde construct, and analyze intelligent systems for decision support based on probabilistic networks. Intended primarily for practitioners, this book does n require sophisticated mathematical skills or deep understanding of the underlying theory and methods nor does it discuss alternative technologies fo reasoning under uncertainty. The theory and methods presented are illustrated through more than 140 examples, and exercises are included for the to check his/her level of understanding.

The techniques and methods presented for knowledge elicitation, model construction and verification, modeling techniques and tricks, learning mode data, and analyses of models have all been developed and refined on the basis of numerous courses that the authors have held for practitioners worl

Uffe B. Kjærulff holds a PhD on probabilistic networks and is an Associate Professor of Computer Science at Aalborg University. Anders L. Madsen hol PhD on probabilistic networks and is the CEO of HUGIN Expert A/S.

Written for: Practitioners

Keywords:

- Bayesian network
- influence diagram
- probabilistic graphical model

Solutions

Solutions to all exercises in the book can be found below.

I Fundamentals

1 Introduction

2 Networks
Solutions (updated 12 February 2009)

3 Probabilities
Solutions (updated 12 February 2009)

4 Probabilistic Networks
Solutions (updated 13 February 2009)

5 Solving Probabilistic Networks
Solutions (updated 16 February 2009)

II Model Construction

1 Eliciting the Model
Solutions (updated 25 July 2009)

2 Modeling Techniques
Solutions and models (updated 15 February 2009)

3 Data-Driven Modeling
Solutions and models and data files (updated 4 August 2009)

III Model Analysis

1 Conflict Analysis
Solutions and models (updated 28 July 2009)

2 Sensitivity Analysis
Solutions and models (updated 15 January 2010)

3 Value of Information Analysis
Solutions and models (updated 3 August 2009)

Errata

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